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ABSTRACT

A high school teacher of history and U.S. Government discusses: the theoretical basis for promoting whole-brained thinking among her students; classroom research she conducted to determine the brain dominance of her students; results of implementation of activities designed to develop more whole-brained thinking in her students; and practical methodologies for teachers who want to implement a program to encourage the development of whole-brained thinking skills. Findings indicated that while activities that promote whole-brained thinking mostly promoted greater left-brained dominance in right-brained students in order to enhance their academic achievement, the activities benefitted high achievers also by helping them to relax and become more open to nonacademic pursuits. Fifteen "Methodologies for Promoting Left-brained Dominance in the Classroom" are given, as well as 13 "Methodologies for Pushing Right-brained Dominance in the Classroom." Brief descriptions are given of lessons which incorporate strategies that elicit right- or left-brained thinking from students. This classroom research served to not only facilitate instructional decisions by the teacher but also to provide students with skills that could be transferred to everyday life. (IAH)

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RESEARCH AND METHODOLOGIES FOR WHOLE-BRAINED INTEGRATION AT THE SECONDARY LEVEL

BY NANCY KEY

U.S. DEPARTMENT OF EDUCATION
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The teacher/researcher MUST BE HEARD!

In "The Benefits of Research," Carol Santa states that "Instructional decisions are best made by teachers who conduct research in their own classroom. They observe their own teaching and analyze the performance of their students."

BRAIN THEORY

My research begins with a classroom test of brain dominance, for a frame of reference. It puts students on a brain-dominance line from 1 (extreme left), up to 9 (extreme right--often fails to stay interested long enough to finish test). After the test is given and scores discussed, students "work with" their brain-side dominance and try to become more whole-brained. We discuss practical methodologies for obtaining this goal! These aren't methods limited to one genre of class or to one type of subject or to one particular age group. Rather, I like to think of it as a model for living--a new awareness of who they are and what they can do!

Why try to promote more whole-brained thinking in the classroom, with transference to everyday life? Well, many former students have come back to tell me how it has helped them, enriched their lives, changed their perspectives, helped them to understand themselves, etc., that it must be doing something good! One student, from a year ago, Jennifer, comes to mind:

Jennifer was a regular type "A" personality--very driven. She didn't seem to want to enjoy school, and would panic if she got an A- instead of an A! She said something to me like I had "Opened up a new awareness in her to slow down and enjoy things." She said her entire high school career was nearly behind her, and she'd never joined a club unless it meant a picture in the yearbook because of it. She had never joined just to enjoy and maybe expand herself in other than academic ways. This particular gal shared some poetry with me that would never have been created if she were still stressed to get her "academic" work done! The poetry didn't even always rhyme--it didn't have to rhyme now--she was able to write what she felt!

Another girl, Michelle, ranked very high academically in her class. She was frustrated with the whole-brained activity at first. She felt it was a waste of time. After a few activities, however, Michelle was able to "let down" and start enjoying getting to know herself better. She had always been really grade-conscious and not enjoying her school work at all!

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Even though this type of research and methodology would mostly be to promote greater left-brained dominance in right-brained people in order to help them reach a greater academic potential, I notice it helping the super achievers again and again to let down and relax more. Seems these activities tell them it's okay to relax and "stop to smell the roses."

Also this year, during my research, a young man who seldom said anything or made contributions in class commented a few times that he truly felt he could become "smarter" and better able to "think" because of our exercises. I think Darryl felt he was "dumb" or an under-achiever. Throughout this entire semester, Darryl continued to participate more, take better notes, score higher on tests, anticipate quiz questions in group discussions, and generally become more "left-brained !" In group work, Darryl surpassed everyone with his art work, but lagged behind if the group work involved writing, reading, understanding, etc. In fact, his first semester grades were all D's and F's except for an A in art. He wants to pursue an art career, but realizes that other classes are equally important in his education. As the second semester marched on, Darryl became noticeably more able to "hold his own" in groups. The people in the groups encouraged him a lot. His girlfriend was also in my class. At first, he would whine if he and Barb weren't in the same group. After about two weeks of supportive group support, it didn't seem to matter which group I put him with. I purposely tried to "mix" my brain-dominance types in order to achieve a good balance. Without the whole-brained awareness this class was obtaining, others in Darryl's groups might have lost patience with him and said he wasn't doing his share. However, the group knew he had potential, as does everyone, and helped him to develop it! Another happening was a marked improvement in Darryl's absences and tardies!

Guiding principles that kept me going in this vein of research resulted from extensive studies I had read about split-brain patients who for some reason have their two brain hemispheres severed. It's usually to stop epileptic seizures from traveling across the corpus callosum. The most noteworthy of this research would be from Speery, 1968, and from Gazzaniga, 1981. With the corpus callosum cut, the two hemisphere halves begin to act independently, and we begin to understand that we do indeed have two separate brains at our disposal! Speery writes:

> In other words, each hemisphere seems to have its own separate and private sensations; its own perceptions; its own concepts.....following surgery, each hemisphere also has thereafter its own separate chain of memories that are rendered inaccessible to the recall processes of the other.

I myself was fortunate enough to view a woman, Vicki, shortly after this surgery. Vicki is a leftie, so the changes seemed even more pronounced. She would want to pick out her clothing for the day, but would be unable to do so with her right hand. The right hand is linked to the left hemisphere, which has no fashion-sense! Then, Vicki would try to balance the check book with her left hand. Becoming frustrated, she would unknowingly grab the pencil in her right hand, which would be better able to

compute figures! The same thing happened when she tried to write anything more technical than a grocery list with her dominant hand.

Another study, done by Michael Gazzaniga, describes a man trying to pull his pants down with one hand and pulling them on with the other. Once he had grabbed his wife with his left hand and shook her violently, while with the right trying to come to his wife's aid and bring the left, belligerent hand under control.

In applying the fact that we actually have two separate brains to classroom application, we need to keep in mind that each of us (with normal development) has the potential for two separate brains, two separate personalities and two separate preferences! Which wins out? Well, in most Western societies, we stress left-brained dominance, and often don't "stop to smell the roses." We call the dreamer "lazy", the unemployed artist "unmotivated" and the person who is always late to appointments "inconsiderate." Are they REALLY, or are they instead merely right-brained people existing in a left-brained society?

Okay, so we stress the LEFT . . . however, if someone is decidedly left-brained---say a 1-2-or even 3 on the simple brain-dominance test, they may encounter problems, too: We call the neatnut "picky" or "obsessive," we call the person who works 12-hour days an "over-achiever," or "back stabber," and we call the person always 30 minutes early to appointments/meetings a "showoff." Can ANYONE win? Yes, they can, with simple instruction through methodology at any age to become more whole-brained. The sides have their appropriate domination times and their inappropriate domination times! Many of us practice this naturally--we're left-brained during the week . . . but, weekend here we come as right-brainers! And, so it should be. But, some people do the opposite, dreamily staring out the window most of the week at school or work, and then panicking over the weekend to get their work done. They have to maintain a proper balance and know that they are in control. Our split-brained patient soon adjusts and automatically handles each situation with the dominant hand and hemisphere for each situation. It will be even simpler for us to accomplish for ourselves, our families and our students.

In some of my early brain-dominance studies, it seemed that whole-brained thinking was not important. Many believed that the truly "great brains" of history such as Einstein <u>had</u> to be left-brained, which made them superior. Well, then you had to explain the right-brained dominant Picasso's of the world--were they superior? With further study, it was shown that even the great thinkers switched back and forth. Think of Leonardo DaVinci creating right-brained masterpieces, yet detailing helicopters with his left-brain so intricately. Research then began to support the fact that when people develop mental areas previously considered weak, this development actually improves all areas of mental performance rather than "taking away" from the more dominant side!

I notice hand dominance differences in the classroom--lefties with the hooked-style of writing--regular lefties, and maybe a hooked-style right-hander (this is rare, but does

occur in about 2% of all right-handers). Supposedly, research (Robert Speery or G. E. Schwartz) would indicate that a hooked left-hander would be left-brained dominant and a regular-writing leftie would be right-brained dominant. Unfortunately, this research isn't always true. I, personally, am a regular writing leftie who is strongly left-brained dominant! Only by marrying a right-brained dominant person and having right-brained dominant children have I learned to develop strategies to become more "whole brained." As my entire family has become more whole brained and I am no longer the only person in the house to straighten towels and squeeze the toothpaste from the bottom, we are becoming happier, less-stressed out and more aware of our special uniqueness. This is a gift we can give to our students as well!

At a recent seminar, Dr. Roger Taylor stressed that you know you're married to a left-brained dominant person if you get up in the middle of the night to use the restroom and when you get back, your side of the bed is made! (I didn't share that one with my students, but was good to hear a noted speaker make such a connection.)
Dr. Taylor also mentioned that people tend to marry opposite brain-dominance people if they marry before the age of thirty, and people more like themselves if they marry past the age of thirty. This might be interesting to share with students. Often, students want to take the brain tests home and try them on parents, friends, etc. I don't discourage this, since it gives students a greater understanding of brain dominance!

Thinking skills of both hemispheres are shaped by culture. We tend to use more processes from the left side, apart from genetics. Norms of society, personal experiences and educational systems foster varying skills, but each person has potential for development of many thinking abilities. Our left hemispheres are predominantly responsible for verbal, analytical, logical, abstract and sequential thought. The right hemispheres are predominantly visual, spatial, intuitive, imaginative and synthetic. The left verbalizes while the right pictures. You'll recognize a familiar face in a crowd with the right side, but recall their name with the left side.

I used to think this type of activity belonged only in psychology classes, and only when we were on the brain unit. Now, however, I feel it can be adaptable to any classroom, any life experience, at any time. We're never too old to experiment with our <u>own</u> brain preferences and to develop strategies to create new patterns of thinking. It isn't as important to assign certain skills to specific brain locations so much as it is important to understand how the total "output" of the brain is a function of the integration of the two hemispheres. <u>Teach children to use both halves!</u>

STEP-BY-STEP GUIDE FOR IMPLEMENTATION

If right-brain dominant people are dreamers and doodlers, they have possibly not done well in our grade-oriented school system. Perhaps they are some of your "special ed." students, perhaps not. Stress their ability to find directions and not get lost. Stress their artistic/musical talents. Tell them that they tend to see the "whole picture" before the others. Right-brain dominant people are terrific advice-givers. They often see the very obvious solutions to problems. Maybe they're not always on

time, but chances are good they don't often wear watches!

Try to let the students know that our culture/educational system pushes left-brain dominant adherence. This isn't bad--we have to drive and read signs and learn languages and balance checkbooks, etc., etc. There are wonderful attributes to all brain-dominance types! (Never call down either brain dominance!)

Now, students scoring in the middle with "average" scores are home-free! They have achieved what I feel is an important objective of this model, but maybe you shouldn't let them relax too soon! By working through both left and right-brained activities in your classroom, students can accomplish some of the goals of higher literacy such as : Higher-ordered thinking, increased creativity, understanding of important connections of understanding, greater empathy for others, keener levels of comprehension, abstract comprehension, time-order understanding, ability to recognize cause and effect, ability to relate stories to real life, development of curiosity, etc., as well as goals of greater cultural awareness and increased individual potential!

The rest is up to you, and is as individualized as you want to make it!

METHODOLOGIES FOR PROMOTING LEFT-BRAINED DOMINANCE IN THE CLASSROOM

Use humor effectively--laugh with your students--even at your own mistakes.

Compliment often, and teach students to accept compliments gracefully.

Organize your room into a more-efficient work place. Separate jabberers, and make an effort to move them closer to you.

Clean up bulletin boards. Make them organized and easily understood. Subtleties they have to look at each day will increase their left-brained awarenesses.

Make clean erasures on chalk board. Use the board and/or overheads and other visuals often. Allow the kids to copy, read and write more.

Eliminate distractions and noises in your classroom. Make it a "learning/thinking" environment. Offer rewards for work completed quickly, if possible.

Urge students to read faster for better understanding. It has been shown in studies recently completed by Tony Buzan that we comprehend groups of words better than we do one word at a time.

Create metaphoric thinking. According to John Barrel in Teaching for Thoughtfulness, by creating and analyzing metaphors the problem will be illuminated and better understood.

Many people don't recall very much after hours of learning and understanding. The reason is that recall tends to get progressively worse as time goes on unless the mind is given brief rests. Teach them to set goals--one page, one chapter, whatever. And, then stick to that goal and reward themselves with a stretch, a glass of milk, or what works for them. You can help them with this in the classroom, or even help them to make a homework journal where they can record study times taken.

Stress the importance of being on time, and encourage these students to wear a watch. A personal planner or at least a calendar is a must. By writing things "to do" down in only one book, they will know exactly what to consult each day. Encourage them to check their calendars daily and to plan their activities. Teach them to keep an "assignments due" notebook, and then to write due dates in their calendars!

We are swamped with "information." Information and publication explosions are continuing at staggering rates, with abilities of individuals to handle this data being ignored. We need to teach our students not a lot of hard facts, but rather new ways of handling and of studying this information. This will enhance their abilities to learn, think, recall, create, and solve problems.

Try all sorts of word-search type activities in "free time" spaces. These can be found in the newspaper or in specialty books. Often, right-brained dominant students pick these right out, while the left-brained dominant students don't "get it." They're probably being too literal and often don't see the whole picture.

Play "what if" games. In social studies, for instance: "What if, during the recent Persian Gulf War, the Patriot Missiles hadn't worked?" This encourages thoughtful classrooms as they consider the possibilities.

Try anagrams such as: 'RABE' = bear. These will oftentimes frustrate the left-brained dominant student since they like order and correctness. These are good practice for the students to learn tolerance as well as strategies for seeing the words .

Any writing or reading or computation skills will also enhance their left-brained ability. This should be done in short segments, so as to not bore the true right-brained dominant student! Melanie Sperling in her "Projects Support Teacher Research" paper stresses that, with practice, the reader should begin to organize, select and connect content, enabling them to improve their techniques and their understandings.

Of course, you can always diagram sentences, but that won't hold their interest for very long.

Have students experiment with the telephone--available in almost any home! If they want to take better directions, they should listen in their left ear, which is mostly processed in the right hemisphere. The right hemisphere understands maps, distances, areas, etc. better. But, you tend to be on the phone longer if you're speaking with someone who is emotional, since that same right side will tend to be

more sympathetic and caring. If students are writing down a recipe or a chemistry assignment, switching to the right ear will make more sense with numbers involved! Also, complicated directions such as: "Put the files in the back room and move the Dodder papers to my desk" should always be written down while listening with your right ear. Be careful, teachers, that you don't have a handicapped student with hearing only in one ear. With the corpus collosum intact, both sides cooperate pretty well, anyway.

METHODOLOGIES FOR PUSHING RIGHT-BRAINED DOMINANCE IN THE CLASSROOM

Give students more options: Reports orally as well as written, for example. This will allow the right brain to picture things and how they fit together, but require fewer mechanics of putting those ideas into writing. Push illustrations, colors, charts, graphs, even cartoons!

Use the board/overhead a lot! Design flow charts, time lines, mapping activities, graphics, etc. Try to give explanations or directions both verbally and visually.

Be unpredictable--write in colored chalk on the board, or even sideways!

Don't recite facts all the time for students to memorize and regurgitate! Allow them to use generalities and perceptions they didn't realize they had through the use of metaphors making connections between two unlike thinkers or with the use of similes. Show them how! Look at stereotypes/cultures/values/ideas which are important for "others."

Let them think "originally"--use brainstorming. Count to ten or twenty before you give them the answer to a question you just asked them. The silence will torture you at first, but will be worth it. Be sure to make lots of eye contact with both boys and girls. Don't let a lot of right-brain dominant students sit together or they'll get nothing done! Of course, the left-brain dominants will be passing notes! Try to mix them up without them realizing. This is very effective with cooperative learning techniques! In these groups, the artistic right-brain dominant student will shine (for a change) if part of the assignment is a map or picture!

Always use techniques tying your lessons together and with proper closure. This not only keeps the left-brain dominant students happier, but allows the brain to work as comes naturally by processing new information with comparison to what is already learned or understood.

Allow activity in your classroom--role-paying, plays, simulations, dressing up, pantomime, etc. to allow for direct experiences by the students.

Allow students time to interact with one another! Getting lots of opinions will help them

to understand several sides to complex issues.

Let the "dust settle" before proceeding. Allow them time to think through what they've just read, just seen on a VCR, or just heard from class discussion. Too long, and the minds wander, though!

Use imagination on room decorations. The neatest classes I've ever seen were in an Englewood Jr. High where art students had individually painted their masterpieces on each and every one of the styrofoam-like squares in the ceiling tile network! It was unbelievable. Of course, you'd have to give some time to looking upwards and experiencing once in awhile!

Use humor---use color. In the middle of a boring test, insert a question that has no real answer, no relevance, no importance. The crazier, the better! This will relax students and teach them it's okay to let down their defenses for a moment and enjoy life--even during a test!

Allow more "hands on" type of learning. Let them not only learn about archeology, but do a "dig" outside with pails, paintbrushes and buckets. (Teacher must bury artifacts prior to "dig.")

Pick a topic and allow the students to brainstorm! Have a student help you write down what's been written. Then, go over them, ranking them, or thinking about them in more detail. Some unusual ones may make sense once they're explained a little.

In the previous methodologies, there is room for expansion to the thickness of volumes, of course. Critics of education have argued for years that our system of education cultivates by design the mass production of students. We have for so long assumed that knowledge is objective and can be drilled into passive, blank-slate brains. The literacy of thoughtfulness, however, says that we always "create knowledge." This is so true! They used to tell us that older people couldn't learn languages, go back to college, etc. "Can't teach an old dog new tricks"--too much brain loss through aging! How untrue this has turned out to be. But, why not begin at an early age with schools which aren't so left-brained dominant so as to forget the Leonardo DaVinci's of the world--the artist who was also inventor/scientist? Both halves must be addressed, and we must teach each student about the two brains within each of us, and arm them with the abilities to develop both hemispheres to their most efficient potential through a lifetime of wholistic brain interactions!

Try it in your classrooms! I actually had better cooperation by not letting the students know about the project and the research. My "control" groups actually "grew" more than my research group did, because the research group got real silly and rowdy about it. This was the first time I had taken it out of a psychology setting, and put it into a U.S. Government class composed of sophomores, juniors and seniors. Some

students loved it, some tolerated it, and a few said it was a "waste of time." I thought for a first try that it did go pretty well.

MY STRATEGIES:

I tried to integrate a little bit of left and a little bit of right-brained strategy into my lessons on a daily basis. We personalized and humanized a boring Declaration of Independence unit by bringing it to life with a short play, using various students for the part of Thomas Jefferson. We had "Tom" on a modern talk show, answering questions such as: Why the term "men created equal" and not "people?" Why weren't women allowed to vote? Black people? Indians? Were they not people? This really seemed to fill in the blanks for my students in making connections between the fact that our "living and breathing" Bill of Rights, Declaration of Independence and Constitution were whatever living men and women interpreted them to be. Their beauty lay in their brevity and room for interpretation. Two hundred years ago, white Anglo-Saxon, Protestant men of wealth created the framework for our great nation. We've come so far from a time when only white men of property could vote and when it was possible to "own" another person! Through this unit, my students developed empathy for women, Indians and black people of that era and of more modern eras, along with a cognitive understanding of the "facts."

TRANSFERABILITY:

In order to make characters in history "come alive" and be more relevant for your students, here are some strategies:

Interview Aristotle--he was convinced that the heart and soul of man was somewhere in the stomach area, never suspecting the importance of that gray matter under the skull! In Western Civilization, interview Constantine about Christianity, Julius Caesar, Hannibal, even crazy Nero. In psychology, Sigmund Freud, of course! Get another teacher to dress up and come in to play the part! Ask him about his sexual hangups! In English classes, interview Shakespeare! The list could go on and on! Be sure the teacher/student/person playing the main character in this mock interview has a pretty good working knowledge of the person they're portraying, or you could transfer some erroneous ideas to these students!

Another strategy: Work with students in "putting themselves into someone else's moccasins." Take the case in 1954 of Linda Brown wanting to go to a grade school closer to home, but being forced to walk about 6 blocks to wait for a bus to travel 3 miles further to go to an all-black school in Topeka, Kansas. Talk to students about the cruelty of children. Did any of them get teased because of their "funny" last name, their hair, their clothing, etc? Have them share! This will put them into a more right-brained mood to listen to the case of Brown v Board of Education, Topeka, Kansas. What connections can they make to Civil Rights movement of the Sixties? Of the Women's Rights movement? Connections to WW II death camps and the feelings of the Jewish people, Gypsies, etc? This would be a good time to talk about the American "melting

pot" where we used to make people become Americanized as soon as possible, speak English, wear American clothing, etc., etc. We didn't even allow them to stable goats in their garages! How has that changed? What insights are they gaining at this point? Can't this be done with many differing disciplines? This sort of activity would lead into a unit on prejudice, discrimination, etc. Eye of the storm, made into a movie, "A Class Divided," would be excellent for closure. One of our district goals is to increase cultural awareness, so this type of activity could be adapted to do just that! Also, field trips, pen pals, guest speakers, etc.

ANOTHER STRATEGY: We've all heard of cooperative learning, but may not be doing enough of it! The individual becomes a part of the group, but great care must be taken to mix-match the kids according to their brain-dominance. If you get a group of right-brained people together, they may have problems staying on task. All left-brained people may have the work completed very quickly, but with little creativity or imagination. A mixture works best--just like with teacher teams! Don't let them decide who will write for the group--or the same person will always write for the group! Do it by hair color, birthdate, etc! Don't assign the art work to the only artistic one in the group--that's too easy! Let them all have a hand in the artwork! Let them use colors, posters, time lines, graphs, maps, etc. The less you tell them, the more they'll panic, but you'll be pleasantly surprised at the results!

The list goes on and on. Dare to be different! Don't get into the rut of giving the same test the same day of each semester....experiment with your students and work with them! Give them constructive knowledge, as well as the ability to create, understand consequences, collaborate, make connections and BECOME WHOLE-BRAINED, WHOLISTICALLY THINKING, HIGHER-LEVEL THINKING members of our community and of our world.

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